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## Georgia Power & Southern Company Services Apply EPRI's ROAM™ to Demonstrate Natural Attenuation of MGP Contaminants

*MGP Site Management Target; Land and Groundwater Business Area  
Science & Technology Development*



**“We used ROAM to demonstrate natural attenuation at three former MGP sites, thereby avoiding groundwater remediation and associated costs estimated at \$1 million per site without increasing environmental risk.”**

- N. Darahyl Dennis  
Georgia Power Company
- Steve Bearce  
Southern Company Services, Inc.

### Benefits

- Georgia Power and Southern Company Services estimate that use of ROAM to demonstrate natural attenuation will translate into more than a \$3 million savings at three former manufactured gas plant (MGP) sites.
- ROAM shows that source removal will decrease concentrations of PAHs in groundwater to acceptable levels within reasonable time frames.

### Challenge

Contamination of groundwater with wastes such as polycyclic aromatic hydrocarbons (PAHs) and cyanide

can occur at former manufactured gas plant (MGP) sites. If contamination is found on a site, environmental regulatory agencies typically require source removal and soil remediation to reduce contaminant levels below standard levels at these sites. In addition, remediation of groundwater contamination is often required—a process that can be even more expensive than soil remediation.

The U.S. EPA and some state regulatory agencies have recently allowed monitored natural attenuation (MNA) as an alternative to active remediation for groundwater restoration. Natural attenuation uses natural processes, combined with site

monitoring, to reduce contaminant concentrations to levels that protect human health and the environment within a reasonable time frame. MNA processes act without human intervention to reduce the mass, toxicity, mobility, volume, and/or concentration of contaminants. Examples of natural attenuation processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization or destruction of contaminants. However, to approve the technique as a remedial option at a particular site, environmental regulators must be convinced that natural attenuation processes will function effectively.

## Response

Georgia Power Company (GPC) and Southern Company Services (SCS) used EPRI's Remedial Options Assessment Model (ROAM) to help persuade the state regulatory agency that natural attenuation to restore groundwater at three GPC former MGP sites merited a trial. A team of GPC and SCS personnel first used the model to simulate existing site conditions—calibrating the model to known concentrations of contaminants in key monitoring wells. They based initial contaminant release dates on GPC records of the MGP operating period. Next, the team modeled removal of the contaminant source, and then ran the model through various time periods to predict concentrations of contaminants in key site wells in future years. ROAM's database of MGP-related contaminants and their properties was crucial to these simulations. To provide further information on the validation of the natural attenuation process to regulators, the team reported actual data from other closely studied MGP sites, including EPRI's Site 24.

Regulators granted approvals that allow postponement of remediation activities for several years, pending results of the groundwater monitoring program. If

contaminant concentrations are not reduced to levels specified in applicable risk-based standards within a reasonable time frame, then regulators will require corrective action for the groundwater. To date, however, monitoring data from the GPC sites indicate that natural attenuation processes are operating as ROAM predicted, and that further corrective actions will likely be unnecessary.

## EPRI Perspective

An increasing number of energy companies are faced with challenging decisions related to soil and groundwater remediation sites. Many operate hundreds of underground tanks at service centers throughout their service territories. In addition, they may be responsible for many more sites with soil residuals from historical operations, such as former underground storage tank sites and MGP sites. These companies need to evaluate the potential of any remediation strategy at such sites. In particular, they need to evaluate leaching of constituents from wastes, including fuels and tar. ROAM is an interactive software model that simulates the implications of remedial measures on contaminant plumes in the subsurface. ROAM can provide the basis for choosing a remedial action at a site, provide an assessment

for acceptance or rejection of a remedial action, and help define preliminary design for a particular remedial action.

## References

- ROAM Version 1.0—Remedial Options Assessment Model: User's Manual and Technical Reference, EPRI interim report, TR-103202, November 1993.
- "PG&E Uses ROAM™ in Risk-Based Soil Cleanup," EPRI Innovators, IN-104474, December 1994.
- "EPRI Software Demonstration Paves Way for IPC Modeling," EPRI Innovators, IN-106653, July 1996.
- "Management of Former Manufactured Gas Plant Sites: A Conversation with WP&L's Joe Shefchek," EPRI Members Speak Out, BR-107120-R1, September 1996.

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## Interest Categories

- MGP site management
- Contaminated sites health and risk assessment
- MGP sites

## Calculated Benefits of Georgia Power's and Southern Company Services' Application

### Basis for Benefits

- Engineered groundwater remediation—pump and treat, for example—typically requires several steps, including selection of technology, treatability studies, design, construction, and operation. Engineered groundwater remediation usually

requires several years to complete. At MGP sites similar in size to those at GPC, engineered groundwater remediation costs at least a total of \$1 million per site. Avoiding these costs at the three GPC sites saves \$3 million.